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The LLNL AMS Facility

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Abstract

The AMS facility at Lawrence Livermore National Laboratory routinely measures the isotopes 3H, 7Be, 10Be, 14C, 26Al, 36Cl, 41Ca, 63Ni, and 129I. During the past year, over 15,000 research samples have been measured. Of these samples, approximately 30% were biomedical 14C tracer samples, 40% were 14C samples for archaeology and the geosciences, with the remaining 30% for the other isotopes. During the past two years, a significant amount of work at LLNL has gone into the development of the Projectile X-ray AMS (PXAMS) technique. PXAMS uses induced characteristic x-rays for discrimination of competing atomic isobars. PXAMS has been most fully developed for 63Ni and shows promise for the measurement of several other long lived isotopes. During the past year LLNL has also conducted an 129I interlaboratory comparison exercise.

Recent hardware changes to our facility include the installation and testing of a new thermal emission ion source, a new multi-anode gas ionization detector for general AMS use, a new cryo-vacuum system for the AMS ion source, and the re-alignment of the vacuum tank of the first of the two magnets that make up the high energy spectrometer. In addition, we have begun design studies and carried out tests for a new high-resolution injector and a new beamline for heavy element AMS.

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